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SCALE DIAGRAMS

A **scale diagram** is a drawing or plan either smaller or larger than the original, but with all sizes in the correct proportion.

Scale diagrams are used by architects, real estate agents, surveyors, and by many other professionals. House plans are a great example of the use of scale diagrams.

On each scale diagram we have a **scale**. This shows the connection between the lengths on the diagram compared with those for the real object.

A scale which says 1 : 200 or 1 represents 200 indicates that lengths on the scale diagram are 200 times larger in reality.

So, if a wall is represented by a 1 cm line on the scale diagram, it is 200 cm or 2 m in reality.

A wall which is 8 m long in reality would be $8 \text{ m} \div 200$ on the scale diagram.

This is $800 \text{ cm} \div 200 = 4 \text{ cm}$.

Example 6

Self Tutor

On a scale diagram, the scale is '1 represents 20'. Find:

- the actual length if the scale length is 3.4 cm
- the scale length if the actual length is 2.4 m.

a	Actual length	b	Scale length
	$= 3.4 \text{ cm} \times 20$		$= 2.4 \text{ m} \div 20$
	$= 68 \text{ cm}$		$= 240 \text{ cm} \div 20$
			$= 12 \text{ cm}$

EXERCISE 12E

- The scale on a diagram is 1 represents 5000.
 - Find the actual length if the scale length is:
 - 4 cm
 - 5.8 cm
 - 2.4 cm
 - 12.6 cm
 - Find the scale length if the actual length is:
 - 500 m
 - 175 m
 - 20 m
 - 108 m
- The scale on a diagram is 1 represents 200.
 - Find the actual length if the scale length is:
 - 3 cm
 - 4.5 cm
 - 8.2 cm
 - 0.8 cm
 - Find the scale length if the actual length is:
 - 200 m
 - 18 m
 - 5.6 m
 - 12.2 m
- The drawing of a gate alongside has a scale of 1 represents 100. Find the actual:
 - width of the gate
 - height of the gate
 - length of the diagonal support.

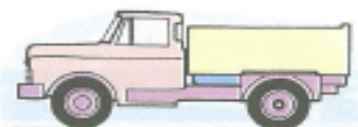


If the plan of a house wall alongside has been drawn with a scale of 1 represents 200, find the actual:

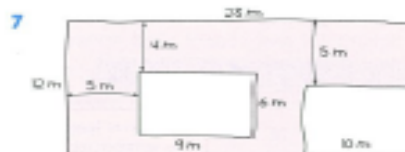
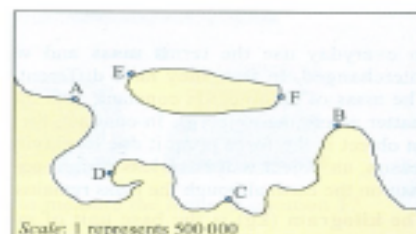
- length of the wall
- height of the wall
- measurements of the door
- measurements of the windows.



- The drawing of the truck has the scale 1 represents 100. Find:
 - the actual length of the truck
 - the maximum height of the truck.



- Using the scale shown on the map, find:
 - the actual distance shown by 1 cm
 - the map distance required for an actual distance of 200 km
 - the actual distance from
 - A to B
 - D to E
 - C to F.



Using the measurements on the given rough sketch and a scale of 1 cm represents 2 m, draw an accurate scale diagram.

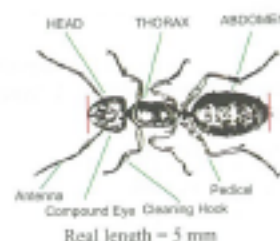


- The front view of a house is shown in the given rough sketch. Using a scale of 1 represents 100, draw an accurate scale diagram of this view.

- Find the scale if:
 - an aeroplane has wingspan 50 m and on the diagram it is 50 cm
 - a truck is 15 m long and its diagram has length 12 cm.



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Alongside is a scale diagram of an ant. The actual body length of the ant between the red lines is 5 mm.

- Measure the length of the ant's body in the diagram in millimetres.
- Explain why the scale is 6 represents 1.
- Using the scale in **b**, find the actual length of the:
 - antenna
 - abdomen
 - thorax
 - head.